WILLIS suggests that all Ceylon species have arisen as single mutations, and that subgenera and genera may arise similarly. Some of the endemics of Ceylon, which are and always have been very restricted, would indicate that the same mutation need not go on appearing in order to become established. However well a species may be locally adapted, it will be in great danger of extermination until it has gotten beyond the degree of commonness represented by "very rare." "Having reached the maximum height [in the scale of commonness] that it is going to reach, a species will ultimately descend, and will sooner or later become extinct, though there is no evidence that as yet many or any species are on the downward road." The statistical facts brought out "support very strongly the hypothesis that the whole tree of descent of a family may exist on the earth at the present moment, and that the area occupied is in general an indication of the age of a species or a genus, if it has not already attained its maximum."—MERLE C. COULTER.

The mosaic disease of tobacco.—ALLARD[10] has given an account of the mosaic disease of tobacco that will be of much interest to all who desire to become acquainted with the chief features of this interesting and destructive disease. The most characteristic external feature of the disease is a mottling of the leaf, due to partial chlorosis. The disease is communicable to a number of the Solanaceae, but appears to be distinct from the very similar mosaic disease of *Phytolacca*. The mosaic virus permeates all parts of the plant, but does not infect the embryo; hence seeds of diseased plants produce healthy individuals. The disease seems to be incurable and no plants of susceptible species seem to be immune. The origin and distribution of the disease are mysterious, and the author's experiments lead him to oppose the more commonly current theory that the disease is associated with unbalanced enzymatic activities and physiological toxins. ALLARD thinks that the disease is parasitic and that it is communicated from plant to plant by certain aphids. No organisms that might be responsible for the disease have yet been isolated. This disease seems to have the characteristics of infectious chlorosis, as described by BAUR.

Further studies of the mosaic disease, also by ALLARD,[11, 12] have to do with interesting special features. It is found that the dilution of the virus to 1 part in 1000 results in no impairment of infection, though dilution to 1 part in 10,000 results in an effective attenuation of the virus activity. While the

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[10] ALLARD, H. A., The mosaic disease of tobacco. U.S. Bureau of Plant Industry, Bull. 40. pp. 33. *pls.* 7. 1914.

[11] ———, Effect of dilution upon the infectivity of the virus of the mosaic disease of tobacco. Jour. Agric. Research 3:295–299. 1915.

[12] ———, Distribution of the virus of the mosaic disease in capsules, filaments, anthers, and pistils of affected tobacco plants. Jour. Agric. Research 5:251–255. *pl.* 1. 1915.

virus does not permeate to the embryo if has been traced to the ovule integuments.—H. C. COWLES.

Leaf anatomy of Veronica.—The xerophytic, shrubby species of *Veronica* indigenous to New Zealand have long excited the interest of ecologists, and now they have been made the subject of a careful anatomical study by ADAMSON.[13] He investigated 39 species, the material being obtained from plants grown in England, although comparison was made with herbarium material. Most of the species are indigenous to the eastern part of the southern island where the rainfall and temperature are low and the wind high. While these species seem admirably fitted for life in such a climate, they show remarkably little plasticity in cultivation. Six ecological groups are recognized as follows: (1) with the large or elongated, not particularly xerophytic, leaves; (2) with leaves similar in aspect, but thick and leathery; (3) with small, spoon-shaped, somewhat xerophytic leaves; (4) with leaves similar in form, but much more leathery and often glaucous; (5) with leaves much reduced and either small and spreading or appressed and imbricate; (6) with leaves toothed and petioled. The most characteristic xerophytic structural features are reduction of leaf surface and of intercellular spaces and high cutinization. In some of the more xerophytic forms there are curved cuticular expansions arching over the stomata, forming an outer vestibule. Hydathodes, usually more characteristic of hygrophytes, are found in some of these species. In general, the increasing xerophytism noted in the first five groups above is correlated with increasing xerophytism of habitat, culminating in the famous whip-cord species, which show a striking resemblance to certain conifers.—H. C. COWLES.

Upper cretaceous and eocene plants.—Only the points of interest to botanists need be considered in this contribution by BERRY.[14] In the cretaceous flora the author describes a number of conifers and angiosperms. In the case of the former, he records his belief that the material identified by HOLLICK and described anatomically by the reviewer as species of the recognized mesozoic *Sequoia*, do not in reality belong to this genus. This is a most interesting statement in view of the fact that some of the reviewer's specimens came from and were identified by BERRY himself. Dr. STOPES in her recent continuation of the catalogues of mesozoic plants of the British Museum, being in possession of some of the reviewer's material, admits that it does not belong anatomically to the genus *Sequoia*. There thus arises a very interesting situation indeed. What BERRY systematically identifies as *Sequoia* is according to Dr. STOPES anatomically not *Sequoia* at all. One wonders if the paleobotanists of the Mesozoic will be as slow to admit that they may be deceived by the external

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[13] ADAMSON, R. S., On the comparative anatomy of the leaves of certain species of *Veronica*. Jour. Linn. Soc. Bot. **40**:247–274. *figs. 17*. 1912.

[14] BERRY, E. W., The Upper Cretaceous and Eocene floras of South Carolina and Georgia. Professional paper 84, U.S. Geol. Survey. 1915.